ENERGY ANGLES

TENNESSEE ENERGY EDUCATION NETWORK

ENERGY DIVISION--DEPARTMENT OF ECONOMIC AND COMMUNITY DEVELOPMENT

November - December, 2005

LOCAL STUDENTS MAKE A PLACE FOR ENERGY AWARENESS

The first place winners in the 2005 TEEN Placemat Contest received their placemats just in time for distribution during Energy Awareness Month in October. Over 10,000 placemats featuring the winning designs were distributed to food establishments in the communities where the winners were located.

Madison Roach from Bethel Springs Elementary School in Bethel Springs received the first place for the 3rd grade category. Her winning placemat was displayed at Atzimba'a Mexican Restaurant in Selmer.

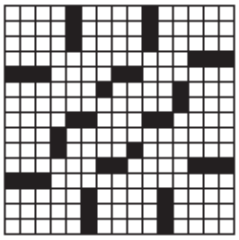
Rachel Sheffey, 4th grade winner from Mountain View Elementary School in Etowah had her winning entry lining the trays at McDonald's.

Tommy Lurks from Dyersburg Intermediate School in Dyersburg was the first place winner in the 5th grade category. He had patrons visiting several restaurants viewing his artwork at Neil's Restaurant, Subway, and Ryan's in Dyersburg.

NEED Team Receives Recycling Award

The Huntingdon Primary School energy team, The Wiser Misers, under the leadership of TEEN teacher, Connie Bond, was recently honored by the Tombras Group of Knoxville for their efforts in recycling and conservation. The Good Sports Always Recycle Award was presented at the UT vs. South Carolina game. Each winning school received on-field recognition during the first time-out of the football game and was presented a $500 check, two complimentary tickets to the game, and sideline passes for each team member present. The award winners were also honored at a small reception in the offices of the Tombras Group and a tailgate party at Circle Park adjacent to Neyland Stadium.

The Wiser Miser Energy Team members lead their school's recycling program in which they collect and recycle newspapers, aluminum cans, plastic containers, ink jet cartridges, and used cell phones. Money earned from the recycling is then donated to local charities. The students work the entire school year doing demonstrations, making presentations, and participating in community service projects to promote wise energy choices. This is all part of their National Energy Education Development project, for which they won state and national recognition last year.



Energy Crossword Challenge

The waiting is over! The TEEN Giant Crossword Puzzle is now available again. The bulletin board size puzzle has over 600 words and is a great fill-in activity for students who finish their work early. Call the Energy Hotline to request this unique teaching resource at 1-800-342-1340.

Don't forget the deadline for sending in your entries for the TEEN Placemat and Bookmark Contests is December 9, 2005. Be sure to follow the entry guidelines carefully. Good luck to all!

MYTHS ABOUT ENERGY CONSERVATION

Following is a list of myths about energy and energy savings. Sometimes the basic premise is correct, but the energy savings are much smaller than people realize. In other cases the myth is based on factors that were once true but have been subsequently resolved through better design or manufacturing of products.

Buying an efficient air conditioner or furnace will automatically reduce my energy bill.
This is true to some extent, but you won't realize all the possible savings if the equipment is not sized or installed properly. Studies have shown that typical air conditioner and duct systems are improperly installed, wasting 1/3 or more of the energy used by the air conditioner. New and replacement equipment (and ducts) need to be properly designed and installed to realize all the possible savings. The same caveats about proper installation hold true for insulation, windows and many other energy-efficiency upgrades.

Energy efficiency and energy conservation are one and the same thing.
Well-intentioned information campaigns during oil crises of the 1970's created a lot of confusion about how to save energy and even about how to talk about saving energy. Energy efficiency means getting a job done with less energy. This could be lighting a room, cooling a house, or refrigerating some vegetables. The things made possible by using energy are sometimes called "energy services," e.g. illumination, comfort, or food preservation. Energy conservation, on the other hand, means reducing the level of services, e.g. reducing lighting or comfort or turning up the temperature of your fridge. Reducing service levels (conservation) does not necessarily mean sacrifice, however. For example, many spaces are overlit by current-day standards, water heater temperature are set too high, etc. Consumers have the option of improving energy efficiency (e.g. by purchasing better appliances) and/or reducing service levels, but lowering the quality of life is not a prerequisite for reducing energy demand.

Duct tape is good for sealing ducts.
Unfortunately, laboratory research has concluded that **duct tape** has very low durability when used to seal ducts. On new installations, tape may fall off due to poor surface preparation, because ducts are installed in dirty and dusty locations and conditions. On older systems, the tape falls off as it ages and the adhesive dries out and tends to wrinkle.

When my appliance is turned off, it's off.
In fact, we've found that most devices continue to **consume power** when they're switched off, sometimes as much power as when they're on!

Cleaning refrigerator coils saves energy.
While this seems intuitively logical, and very small savings may indeed arise, efforts to actually measure this effect have typically come up empty-handed.
Installing foam gaskets in electrical outlets will significantly reduce air leakage. Measurements have shown that less than 1% of a home's air leakage is due to outlets.

Leaving lights, computers, and other appliances on uses less energy than turning them off and makes them last longer.
The small surge of power created when some devices are turned on is vastly smaller than the energy used by running the device when it's not needed. While it used to be the case that cycling appliances and light

ing on and off drastically reduced their useful lifetimes, these problems have been largely overcome through better design.

Energy efficiency increases the first cost of houses.

While efficient products may initially cost more, in some cases there may be little or no first cost. Most efficient products are also premium products (in terms of features, warranty, etc.), so it's difficult to say what you are paying for the efficiency. Market data have shown, for example, that there is little or no correlation between refrigerator efficiency and purchase price. In some instances, efficiency can even reduce first cost as in the case where smaller ("downsized") heating and cooling systems can be installed if they're highly efficient. Smaller units with high efficiency generate as much heating or cooling benefit as large, inefficient ones.

Insulating the ceiling will just cause more heat to leak out of the windows.

Adding insulation to one part of a home won't increase the "pressure" on heat losses through other parts. However, it is certainly true that poorly insulated areas will be the major loser of heat and they often merit attention before improving already well-insulated parts of the home.

Switching to electric room heaters will reduce your energy bill.

This is true only under some circumstances. If you have central electric heating, then using **room heaters** will most likely save you money. But, if you have central gas heating (which is far cheaper per unit of useful heat) you can easily match or even exceed your heating bill by switching to electrical units.

Fluorescent lighting is unhealthy.

Fluorescent lighting has changed dramatically in the last few years. Today's fluorescents have greatly improved color quality. The annoying flicker and hum have been eliminated from fluorescents that use electronic ballasts. Because they require less electricity, fluorescents generate less power plant pollution, emissions which have many known health effects. Fluorescent lights also contain small amounts of mercury and should be disposed of properly. However, additional mercury releases are avoided thanks to reduced use of mercury-containing fossil fuels used to generate electricity. If it's been a while since you tried fluorescent lights, you might give them another chance.

Halogen lighting is super-efficient.

It's true that halogen lights use slightly less energy than standard incandescent bulbs, but halogens require transformers that can use extra energy, even when the light is off. They are also a fire hazard. By comparison, compact fluorescent lights are nearly three-times as efficient and don't pose a fire hazard. Many new models are dimmable, like halogens.

Electric heating is more efficient than fuel-based heating.

It's true that all, or almost all, of the electricity that goes into an electric heater is transformed to useful heat in your home. However, making electricity is an inefficient process, with as much as two-thirds of the input energy (coal, natural gas, etc.) being lost in the process. This is why electricity is so much more expensive for the consumer than direct fuels.

From http://homeenergysaver.lbl.gov/hes/myths.html

NOTE: This article is an excerpt from the Accent Unit on Energy Conservation. To access this great teaching resource along with many other topics, visit the Accent website at http://www.roanestate.edu/webfolders/allenac/accentunits/

Check out our latest issue of Energy Angles on our website at: http://www.state.tn.us/ecd/energy_teen.htm

Waste-Free Holidays

Did you know that over 5 million TONS of extra trash is created just from the holiday season and it is increasing every year? That includes 10 billion pounds of gift wrap, cards, packing materials, boxes, plastic ribbons, product packaging, discarded decorations, cut trees and more. Just think about all the energy and chemicals and toxins that are used in the manufacturing of all those items and in their transportation from factories to stores to homes and finally to trash dumping sites.

Here are some lesson ideas to help teach students about the importance of remembering to reduce, reuse, and recycle during the holidays.

Rustle the Leaf lesson plan, "How to Have a Green Holiday," is geared for grades 3-6 and includes information, a worksheet and activity ideas for the classroom and home. http://www.rustletheleaf.com/1204_lesson.pdf

Let the students use recycled magazines, junk mail, other brightly colored paper to make necklaces for gifts. Great art project!
http://www.educationworld.com/a_lesson/03/lp308-01.shtml

Teach a lesson on Kwanza and make an Oware game from a recycled egg carton and stones. The *Oware game* is played in many parts of the Motherland. In East Africa it is called Mankala, in South Africa it is called Ohoro and in the west, it is called Oware or Ayo. For complete instruction visit http://members.dca.net/areid/oware.htm

Here is an idea that uses empty pill bottles to make a Hanukkah craft. http://www.akhlah.com/holidays/hanukkah/hanukkah_crafts/match_holder.php

Energy Efficiency Improves Air Quality

ENERGY ANGLES
Tennessee Energy Education Network
TN Dept. of ECD/Energy Division
312 Eighth Avenue North, Tenth Floor
Nashville, TN 37243-0405

Chyrall Dawson
Program Manager
Toll-free: 1-800-342-1340

Editors:
Anne Allen
865-531-8051
Ramona Nelson
731-426-0536

ENERGY ANGLES
is published five times a year by the Tennessee Energy Education Network, a program of the Energy Division, Department of Economic and Community Development.

This public document was promulgated at a cost of $2,956 or .30 each. 10,000 copies. Authorization No. 30937. August, 2005.

energy UPDATE

Compiled by the Tennessee Energy Education Network **November-December 2005**

The High Cost of Clean Towels

While it's a small sacrifice on your part, there are big benefits to reusing towels and bed linens for two or three days during a hotel stay. The National Assoc. of Institutional Linen Management estimates that hotels can save more than $6.50 a day per occupied room by such voluntary actions by guests.

By Judith Stock , National Wildlife News at http://www.nwf.org/

Did You Know?……

The state of Virginia now allows hybrid car owners to ride in carpool lanes even if there is only one person in the car. Congress is working on a law that will make it legal for single hybrid drivers to ride in the HOV lane everywhere in the country. It is a great incentive to get people to buy hybrid cars.

Clark Howard Show

Green Consumer

When actor Alicia Silverstone traveled to San Francisco not long ago, she asked her friend Woody Harrelson to recommend a hotel. He suggested the Hotel Triton, located just steps away from the grand arches of Chinatown and a block off Union Square. Harrelson didn't base his recommendation simply on location, however. He also was impressed by the conservation program the staff implemented to reduce the facility's environmental impact.

The Triton is among the many hotels, resorts and inns across the country trying to reduce solid waste and energy and water consumption. In some facilities, as many as 90 percent of the guests are now participating in eco-friendly programs, such as not having their sheets and towels changed daily.

By Judith Stock at http://www.nwf.org/nationalwildlife/article.cfm?issueID=76&articleID=1103

Flesh-eating Caterpillar Spins Deadly Silk

In Hawaiian rainforests, scientists have discovered tiny caterpillars "gluing" snails to leaves with silk webbing and then feasting on snail flesh, leaving nothing but empty shells.

The caterpillars start eating at the wide opening of the paralyzed snail's shell and chomp on the snail's body until there is nothing left.

These caterpillars are small, not as long as a single key on a computer keyboard. The caterpillar bodies are mostly covered by a silk case that looks like a miniature sleeping bag. When it's time for the caterpillar to develop into a moth, this case becomes the cocoon.

These caterpillars are the first caterpillars that scientists have observed using silk to paralyze their prey, similar to the way spiders use silk.

http://www.eurekalert.org/kidsnews/

Dig a Hole To The Middle of the Earth?

Ever wonder what you'd find if you could travel to the center of the earth? Someday, we might find out, says geophysicist David Stevenson of the California Institute of Technology. Stevenson has thought up a way to send a probe to Earth's core. For now, his plan is mostly just a cool idea. Quite a few obstacles keep it from being practical.

So far, the deepest anyone has drilled into the earth is 10 kilometers. The hard crust of continents probably goes down at least another 200 kilometers. Below that lies a gooey layer called the mantle, which surrounds a liquid outer core and a solid inner core. Both inner layers are made mostly of iron.

Stevenson's idea is to blast a hole 300 meters deep and 10 centimeters wide. Into the hole, he would pour melted iron, which would flow downward and create enough pressure to push the crack to Earth's center. He estimates it would take the probe about a week to get there. Blasting a big enough crack would take about the same amount of energy as that contained in a basic hydrogen bomb. The biggest challenge would be building the probe. The center of the earth gets so hot and there is so much pressure that most metals would melt. Electronic equipment would fall apart.

E. Sohn in Science News for Kids
http://www.sciencenewsforkids.org/articles/20030521/Note2.asp

Kentucky Gets New Hybrid Line

Toyota will start making hybrid Camry sedans in Kentucky in about a year, but the company's other North American plants may not be far behind in building gasoline-electric cars and trucks. It will be at least a few years before Toyota introduces hybrids to plants in Southern Indiana, California, Texas, Canada and Mexico, but company officials said demand is growing quickly.

The company will spend about $10 million and add 100 jobs to the 7,000-worker plant in Georgetown, KY, its biggest outside Japan.

http://www.courier-journal.com

New E-mail UV Alert System Joins Fight Against Skin Cancer

E-mail has joined shade, sunblock, sunglasses, and protective clothing as the latest tool to fight skin cancer and other harmful effects of the sun's ultraviolet (UV) rays. Registering for the new UV Alert system takes just a few clicks on EPA's Web site.

The UV Alert system — a free service that notifies e-mail subscribers when solar UV radiation and the risk of overexposure is predicted to be unusually high – is based on the National Weather Service's daily UV Index forecasts. The system delivers warnings directly to e-mail in-boxes across the country.

The UV Index informs people when rays will be strongest and provides suggestions on how best to protect themselves from the harmful rays. UV Alerts are expected to be more frequent from spring through fall and in parts of the country where the amount of sunlight often varies. The NWS and EPA provide daily UV Index forecasts for 58 major metropolitan areas and by ZIP Code. The free email UV alerts are available online at: http://epa.gov/sunwise/uvindex.html. .

EPANEWS
October, 2005

Urine Battery Turns Pee Into Power

Before you next flush the toilet, consider this: Scientists in Singapore have developed a battery powered by urine. Researchers created the credit card-size battery as a disposable power source for medical test kits. Scientists have been scrambling to create smaller, more efficient, and less expensive "biochips" to test for diseases such as diabetes. (Diagnostic test kits commonly analyze the chemical composition of a person's urine to detect a malady.) Until now, however, similarly small batteries to power the devices remained elusive. Ki Bang Lee and his colleagues realized that the substance being tested—urine—could also power the test. "All jokes [about] urine aside, what is needed are low-cost batteries. …" he said. "The other neat thing about this is the fact that it's basically a biodegradable battery."

To make the battery, Lee and his colleagues soaked a piece of paper in a solution of copper chloride and sandwiched it between strips of magnesium and copper. This sandwich was then laminated between two sheets of transparent plastic. When a drop of urine is added to the paper through a slit in the plastic, a chemical reaction takes place that produces electricity, Lee said.

The prototype battery produced about 1.5 volts, the same as a standard AA battery, and runs for about 90 minutes. Other bodily fluids, such as tears, blood, and semen, would work easily as well to activate the battery.

While medical devices inspired the urine battery, it can activate any electric device with low power consumption, according to Lee. "For example, we can integrate a small cell phone and our battery on a plastic card. This can be activated by body fluids, such as saliva, during an emergency," he said.

National Geographic News at
http://news.nationalgeographic.com/news/2005/08/0818_050818_urinebattery.html.
August 18, 2005

Weekend Weather Really Is Different

Do you ever feel like the weather is out to get you? All week long, it seems, you sit inside at school while the sun shines outside. Then, as soon as the weekend comes, the sky turns gray. There's rain in the forecast.

In some ways, you may be right. Weekend weather differs from weekday weather in certain places, say researchers who studied more than 40 years of weather data from around the world. They focused on temperature differences between daytime highs and nighttime lows. This difference is called the diurnal temperature range, or DTR.

Part of the study involved 660 weather stations in the continental United States. At more than 230 of these sites, the average DTR for Saturday, Sunday, and Monday was different from the average DTR for Wednesday, Thursday, and Friday, the researchers found. The difference was small—only several tenths of a Celsius degree—but the pattern was striking enough to make the scientists take notice. This sort of weekly rise and fall doesn't line up with any natural cycles, the researchers say. Instead, they blame human activities, possibly air pollution from those activities, for these weather effects. For example, tiny particles in the air could affect the amount of cloud cover, which would in turn affect daily temperatures.

So, tiny windborne particles from California, generated on weekdays, might first affect weather close to home in the southwest, then later influence midwestern weather. It looks like your weekend weather has a lot to to do with which way the wind blows and where it comes from.

Emily Sohn From Science News for Kids
Oct. 15, 2003.
http://www.sciencenewsforkids.org/articles/20031015/Note3.asp

The information in Energy Update is compiled from various sources and published three times a year by the Tennessee Energy Education network, a program of the Tennessee Department of Economic and Community Development, Energy Division. This publication is distributed to Tennessee teachers and members of the Women's International Network of Utility Professionals (formerly Electrical Women's Roundtable). WiNUP is an organization of professionals whose business occupations are involved in electrical and allied industries. For additional copies or comments, contact Anne Allen, TEEN, Wm. R. Snodgrass/ TN Tower, 312 8th Ave N.,10th floor, Nashville,TN 37243-0405. 1-800-342-1340 inside Tennessee. 615-674-2994 outside Tennessee.